PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: A8240

William WILBER, et al.

Appln. No.: 09/987,353

Group Art Unit: 2817

Confirmation No.: 6948

Examiner: Stephen E. JONES

Filed: November 14, 2001

For: TRIPLE-MODE MONO-BLOCK FILTER ASSEMBLY

SUBMISSION OF EXECUTED DECLARATION UNDER 37 C.F.R. §1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is an executed Declaration Under 37 C.F.R. §1.131 signed by William WILBER and Chi WANG.

Respectfully submitted,

Kevin M. Barner

Kevin M. Barner
Registration No. 46,075

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: September 8, 2003

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

William WILBER, et al.

Docket No: A8240

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Examiner: Stephen E. JONES

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For: TRIPLE-MODE MONO-BLOCK FILTER ASSEMBLY

DECLARATION UNDER 37 C.F.R. § 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

We, William Wilber and Chi Wang, hereby declare and state:

THAT, we are co-inventors and co-applicants of the invention entitled "TRIPLE-MODE MONO-BLOCK FILTER ASSEMBLY" as disclosed and claimed in the above-referenced application, U.S. Application No. 09/987,353 filed November 17, 2001 (hereinafter, "the subject application");

THAT, in connection with the prosecution of the subject application and specifically the Office Action dated May 6, 2003, the Examiner has rejected claims 1, 4, 7, 15-16, 36-38, 40 and 42-43 under 35 U.S.C. § 102(a) as allegedly being anticipated by Japanese reference JP2001060804A, entitled Dielectric Resonator and Dielectric (hereinafter, "the Ko reference");

THAT, we have reviewed the Office Action in detail, including the Examiner's reasons for rejecting the claims;

THAT, the Ko reference was published on March 6, 2001; and

THAT, in view of the factual information set forth below, in regard to our invention claimed in the subject application, we invented the claimed subject matter prior to March 6, 2001.

FACTUAL INFORMATION

The triple-mode filter development program, i.e., the genesis of the subject application, was started at least as early as August 2000 by Chi Wang at Radio Frequency Systems in Marlboro, New Jersey (the company has since moved to Connecticut). Two pages from the notebook of Chi Wang (dated 8/28/00) are attached as Appendix A. The notebook pages show several sketches that indicate the basic shape of the ceramic blocks (blocks with two or three 'corner cuts'). The three electromagnetic modes (TE101, TE110 and TE011) are also explicitly referenced. There is also a very rough sketch showing two blocks connected together with some type of connector coming from the bottom of each block. These notes show the fundamental method for reducing the size of the block resonator by exciting three orthogonal modes (TE101, TE110, and TE011).

Appendix B, also attached, is a copy of a page from the laboratory notebook of William Wilber, dated 18 September 2000. This notebook page shows a detailed drawing (dimensions in inches) of the two ceramic blocks, with the two blocks connected together by a small wavegulde (labeled as 'air iris'), along with the two input and output probes. The dimensions of the blocks, corner cuts, air iris, and probes are shown. The detail on the input and output probes (either probe can be used for input or output) shows how the energy is directed into the ceramic blocks

in order to excite the resonant modes. The corner cuts serve to couple energy from one mode to another, as described in the subject application.

Following the initial design, two sets of ceramic blocks were ordered from Kyocera Corporation, a well-known supplier of dielectric materials for microwave applications. (Kyocera supplies several 'standard' dielectric elements for some of the filters that we manufacture with single-mode resonators.) The two drawings from Kyocera (based on the dimensions supplied by RFS) are attached as Appendix C. Drawing number S-357578-1, identified in the lower right-hand corner of the drawing, is for a block that is, in general, slightly smaller than our target design, and drawing number S-3575860 is for a block that is, in general, slightly larger than our target design. We ordered these two sets because, at that point, we were unsure of the accuracy of our simulations, and we wanted to see the effect of the change in dimension of the blocks.

The drawings of Appendix C show that the blocks were to be made from Kyocera's SB350 material, which is a ceramic material with a dielectric constant of approximately 35. The drawings show that the blocks are to be silver plated, except in the marked areas. These drawings are dated 11 October 2000, and the approval from Chi Wang is dated 16 October 2000, as shown in the upper left-hand corner of the drawings. Two blocks would be used to construct a single 6-pole filter. The use of this type of dielectric material allows for the reduction in size of the filter. The size reduction follows approximately as the inverse of the square root of the dielectric constant. One could use a material with an even higher dielectric constant, but the dimensional accuracy becomes even more critical and is, practically, very difficult to successfully handle.

Appendix D is Radio Frequency Systems drawing No. 802100046, dated 20 November 2000. This drawing shows the plate used to create the 'air iris' described in the drawing from the laboratory notebook of William Wilber, App. B. The 'air Iris' is created by the hole in the center of the plate when this plate is placed between the two ceramic blocks such that the rectangular areas on the blocks that are not silver plated (as shown in the Kyocera drawings) face each other and are separated by the plate. One can see that the inner dimension of the plate (0.424 inches by 0.140 inches) matches the area of the blocks that are not covered by silver plating. The drawing from the laboratory notebook of William Wilber, App. B, shows the air iris thickness as 0.150 inches, matching the thickness of the plate. The only difference in dimensions between the plate drawing of App. D and the notebook drawing, App. B, is the height of the opening. The notebook shows an opening of 0.402 inches while the plate drawing shows 0.424 inches. The 0.424 inch opening is the revised dimension that was used before ordering the ceramic blocks.

The final two documents, attached as Appendix E, are Certificates of Conformance from Kyocera, showing data measured by Kyocera for the two sets of blocks that were shipped to Radio Frequency Systems. The certificates are dated 28 November 2000. These two sets of ceramic blocks constitute the essential building blocks of the first two triple-mode mono-block filter assemblies ever built, to the best of our knowledge.

The parts illustrated in the attached appendices, A-E, were used to build the 6-pole filter that was described in the initial patent disclosure of the subject application. These documents are provided to show that the triple-mode mono-block filter assembly as claimed in at least claims 1-45 of the subject application was conceived and reduced to practice before 6 March 2001.

We declare further that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 9/2/03

William Wilber

Date: 8/27/03

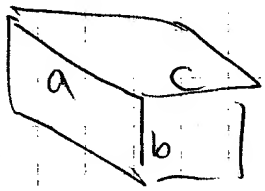
Chi Wang

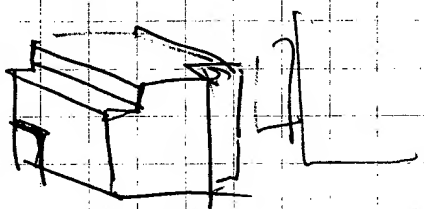
APPENDIX A

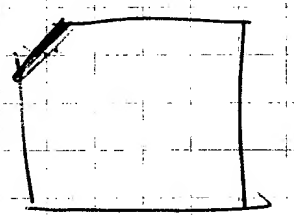
8/25/00.

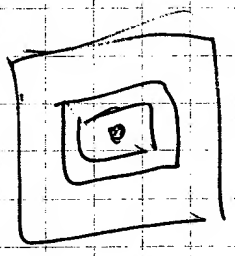
- IRM800. 490168
- 5489.
- 5568
  5579
- 5588, 5589.

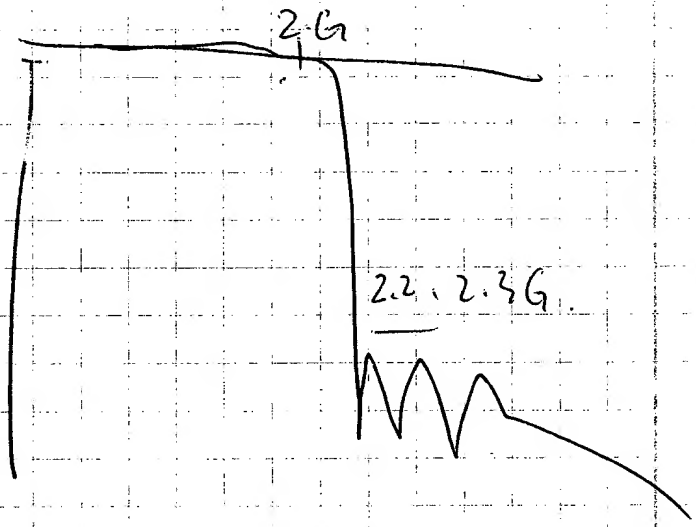
8/28/00.







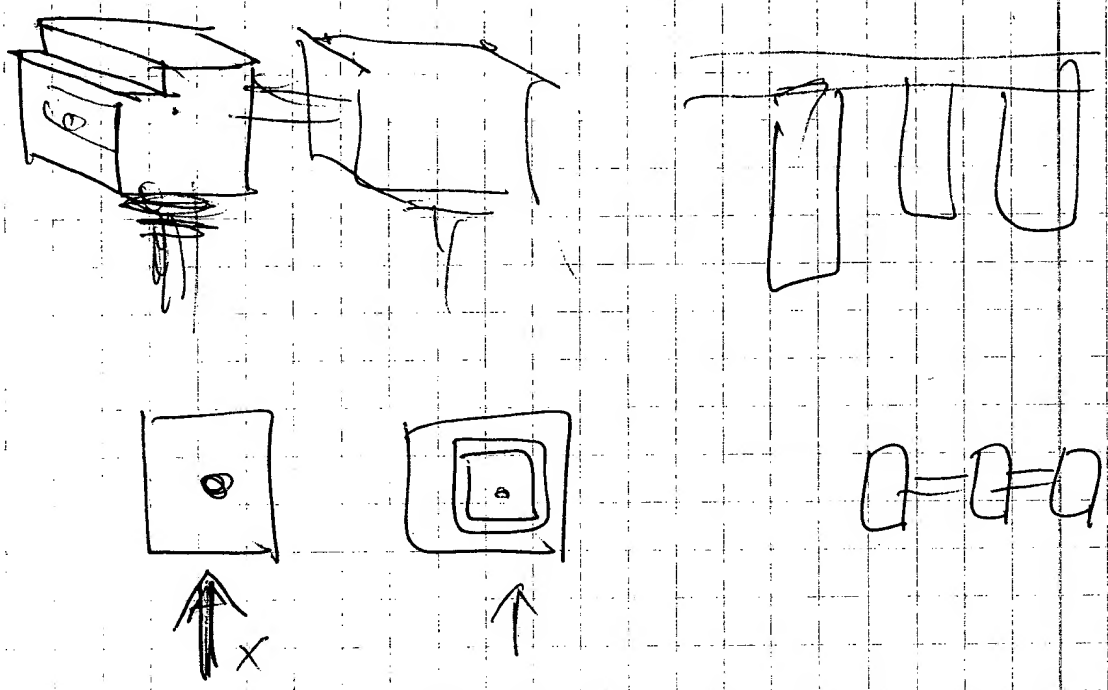




TE_{101}
110
011

$$f_0 = \frac{c}{2\pi\sqrt{}}$$

$$\frac{1}{Q_t} = \frac{1}{Q_c} + \frac{1}{Q_d}$$



8/30/00

A Band 820 MHz — ~~55~~ dBc Send Simulation. result to Brad.
851 MHz — 54 dBc.

first prototype. week 39 ~ 40.
6, Week 44. 12, week 47.

(24) unit by week 44.

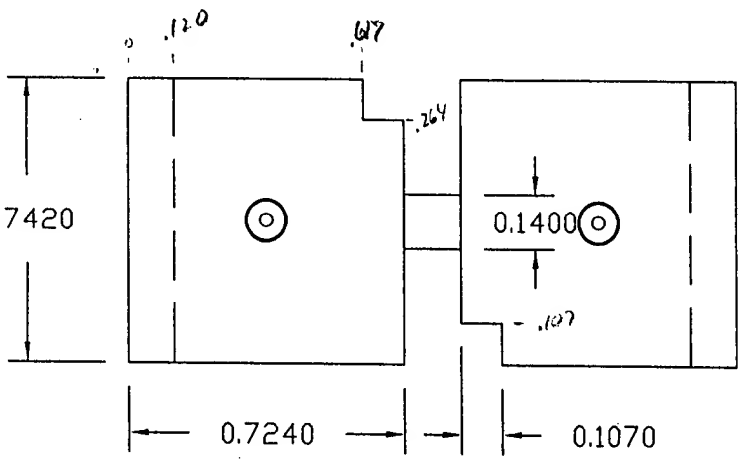
B Band 831 MHz — ~~55~~ dBc.
851 MHz — 57 dBc.

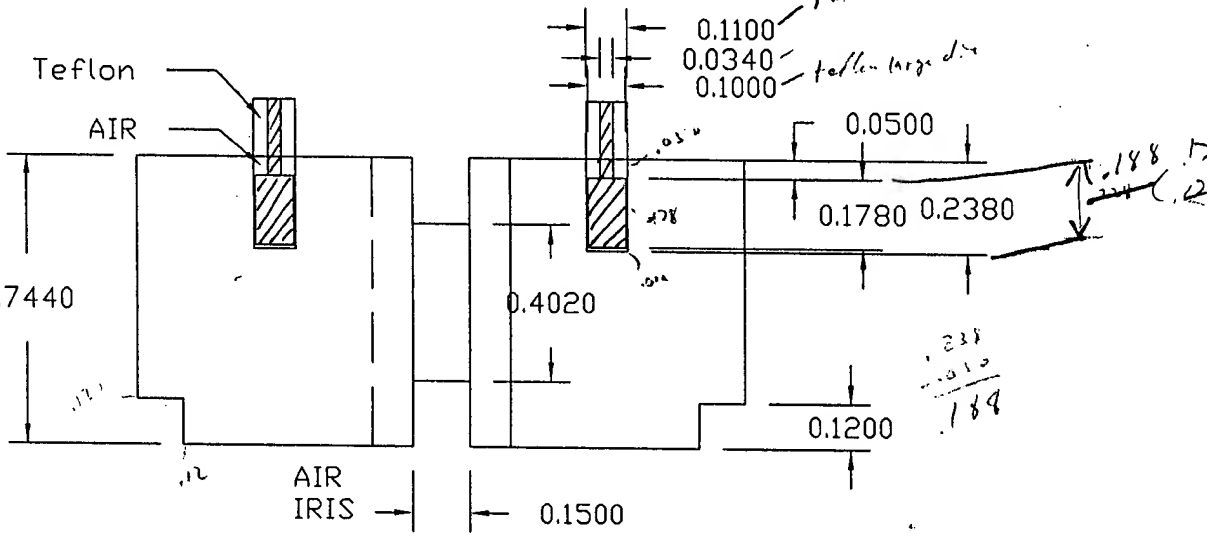
APPENDIX B

18 September 2020

William Wilder 9/18/00

Dimensions (drawing) from Chi Wang





APPENDIX C

REQUEST FOR APPROVAL

RETURN ONE COPY TO VENDOR WITH APPROVAL SIGNATURE

APPROVED: [signature]

DATE: 10/16/00

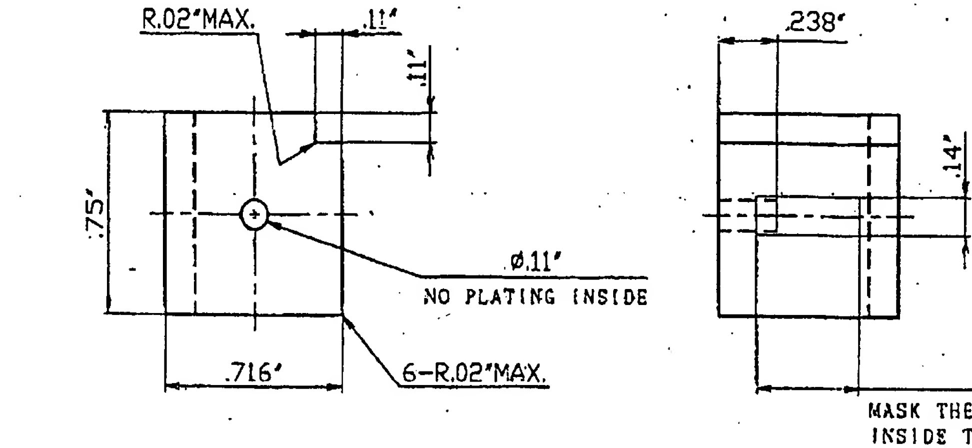
KYOCERA CORPORATION

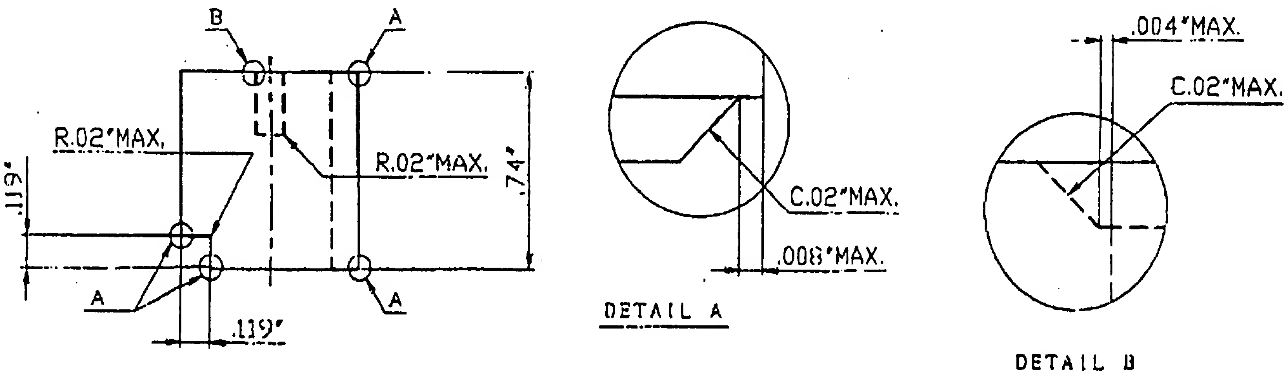
2/2

NOTES,

1. εr:35.256±0.2
2. SILVER PLATING OUTSIDE EXCEPT C'BORE AND APERTURE

Smaller





KYOCERA CORPORATION OCT.11.2000 SHIGA PLANT GAMO CERAMIC DIVISION

MODIFICATIONS			
1	TOLERANCES	Oct.10.'00	
0	FIRST EDITION	Sep.25.'00	
REV.	CHANGE	DATE	

COMPANY: CELWAVE Division of Radio Frequency System, Inc.		DWG.No.		
NAME: SB350 BLOCK A		TOLERANCES: UNLESS OTHERWISE SPECIFIED	DRAWN	CHECKED
SCALE	MATERIAL	±.012"	[signature]	[signature]
FREE	KYOCERA SB350D		APPROVED: [signature]	

KYOCERA CORPORATION KYOTO JAPAN DWG.No S-35757B-1

REQUEST FOR APPROVAL

RETURN ONE COPY TO VENDOR — WITH APPROVAL SIGNATURE

APPROVED : [signature]

DATE : 10/16/00

JULIE
FRANK

PLS GET CUSTOMER'S APPROVAL

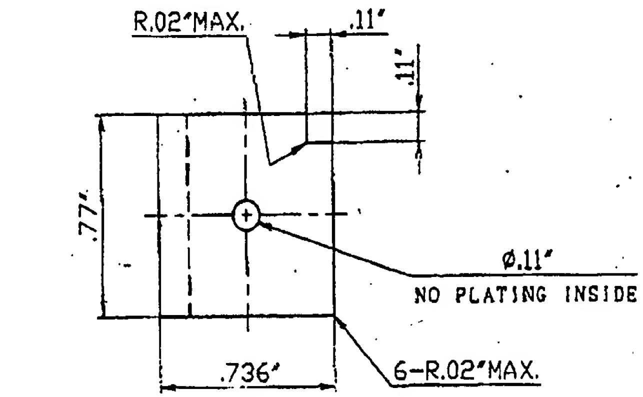
1/2 ← CONAN

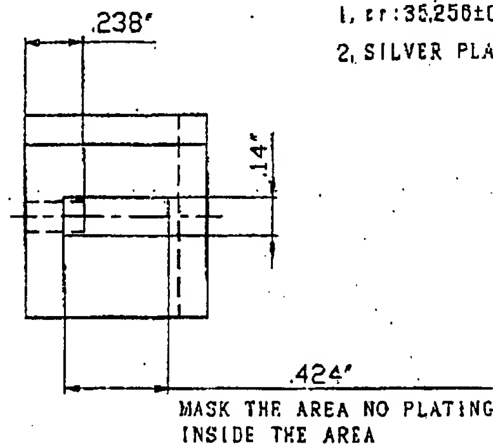
00.10.12

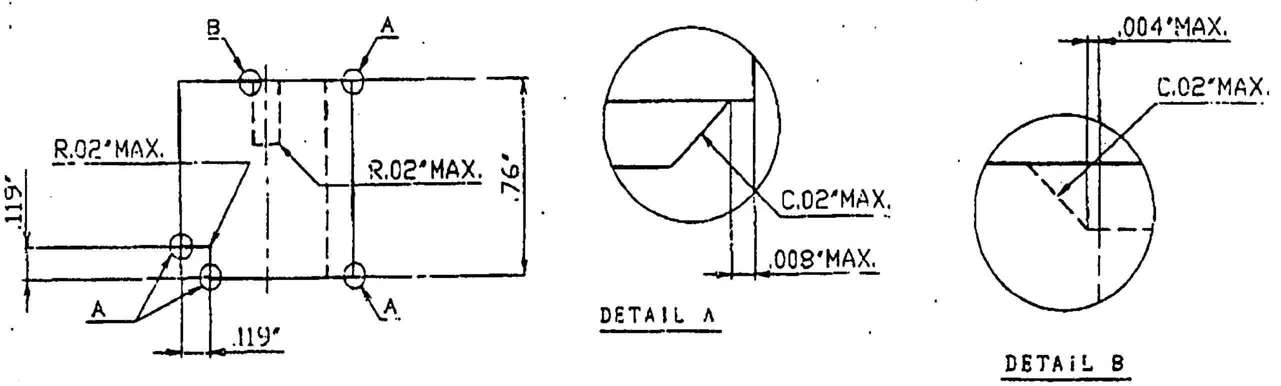
KYOCERA CORPORATION

NOTES,
1. εr:35.256±0.2
2. SILVER PLATING OUTSIDE EXCEPT C'BORE AND APERTURE

Larger







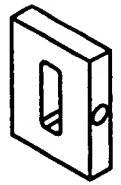
KYOCERA CORPORATION OCT.11.2000 SHIGA PLANT GAMO CERAMIC DIVISION

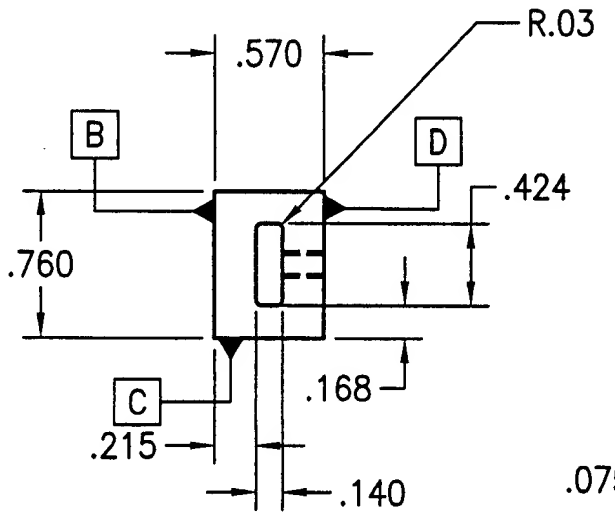
MODIFICATIONS			COMPANY: CELWAVE Division of Radio Frequency Systems, Inc.	DWG.No.
0	FIRST EDITION	00.10.'00	NAME: SB330 BLOCK B	TOLERANCES: UNLESS OTHERWISE SPECIFIED ±.012"
REV.	CHANGE	DATE	SCALE: FREE / MATERIAL: KYOCERA 3D350	DRAWN / CHECKED / APPROVED

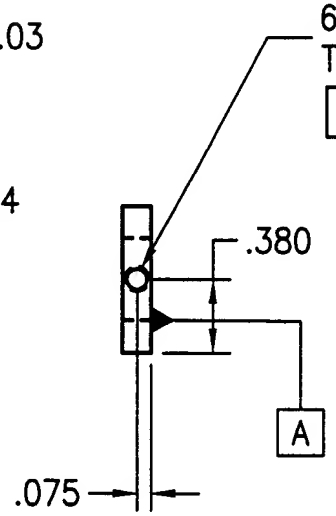
KYOCERA CORPORATION KYOTO JAPAN DWG.No. S 337588-0

APPENDIX D

A	REVISION







NOTES:
1. MAT'L: ALUM ALLOY 6061-T6, .150 THICK
2. UNLESS OTHERWISE SPECIFIED ALL MACHINED SURFACES SHALL BE WITHIN 63 MICRO INCHES.
3. UNLESS OTHERWISE SPECIFIED DEBURR AND BREAK ALL SHARP EDGES AFTER MACHINING.

PRELIMINARY

PART NO. DRAWING NO. + PROCESS + GRP	MANUFACTURING PROCESS
802100046100	FABRICATE PER DWG.
802100046900	?

Dimensioned per ASME Y14.5M-1994	
Block Tolerances: .000 = ±.005 .00 = ±.01 0° = ±1°	Units: Inches [mm]
Drawn by: JMILOS	Date: 20NOV00
Approved by:	Date:

RADIO FREQUENCY SYSTEMS
CELWAVE Cablewave

Title: PLATE TEST HOUSING 5591

Size	Drawing No.	Rev
A	802100046	A

608000001500 Rev: 2

APPENDIX E

I

KYOCERA

KYOCERA CORPORATION
6 Takeda Tobadono-cho
Fushimi-ku, Kyoto
612-8501 Japan
Phone : 075-604-3500
Facsimile : 075-604-3501

Date : 2000.11.28

204448
No. E50877702

CERTIFICATE OF CONFORMANCE

Customer Name : CELWAVE
Purchase Order No. : Z 342894
Part Name : SB350 BLOCK A
TRIPLEMODE RESONATOR
Specification No. :
Drawing No. : S-357578-1

Lot No.	Quantity	Lot No.	Quantity
0001	2		

Total: 2 pcs.

It is hereby certified that the materials being furnished in the quantity specified on the shipping memo have been produced in accordance with our normal processes and controls, and in conformance with the requirements of the referenced purchase order, specifications and drawings.

by S. Kurosawa
Manager, Quality Assurance

I

INSPECTION SHEET

Customer : CELWAVE NJ/IND
Article : SB350 BLOCK A
Material : SB350

Lot No. : 1
Quantity : 2
Date : Nov. 27. 2000

Item	A	B	C	D	E	F	G	H	I	J εr	K VISUAL
Spec.	0.716	0.750	0.740	0.110	0.238	0.110	0.119	0.140	0.424	35.256	
(+)	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.200	
(-)	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.200	
1	0.717	0.750	0.741	0.107	0.236	0.111	0.120	0.141	0.424	35.190	
2	0.717	0.750	0.741	0.107	0.240	0.111	0.120	0.142	0.425		
3	0.717	0.750	0.741	0.107	0.238	0.111	0.120				
4	0.717	0.750	0.740	0.107	0.238	0.110	0.119				
5	0.716	0.750	0.739	0.107	0.238	0.109	0.118				
6											
7											
8											
9											
10											
MAX.	0.717	0.750	0.741	0.107	0.240	0.111	0.120	0.142	0.425	35.190	
MIN.	0.716	0.750	0.739	0.107	0.236	0.109	0.118	0.141	0.424	35.190	
R	0.000	0.000	0.001	0.001	0.004	0.001	0.002	0.000	0.000	0.000	
n	5	5	5	5	5	5	5	2	2	1	5
Ave.	0.716	0.750	0.740	0.107	0.238	0.110	0.119	0.142	0.425	35.190	
Result	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC

(Remarks)

smalla

(Judgment)

Acceptance KYOCERA QA DIVISION

Witnessed by: R. Nakano

Inspected by: T. Hobayashi

KY-390

KYOCERA CORPORATION

II

KYOCERA

KYOCERA CORPORATION
6 Takeda Tobadono-cho
Fushimi-ku, Kyoto
612-8501 Japan
Phone : 075-604-3500
Facsimile : 075-604-3501

Date : 2000.11.28

204449
No. E50877725

CERTIFICATE OF CONFORMANCE

Customer Name : CELWAVE
Purchase Order No. : Z 342894
Part Name : SB350 BLOCK B
TRIPLEMODE RESONATOR
Specification No. :
Drawing No. : S-357586-0

Lot No.	Quantity
0001	2

Lot No.	Quantity

Total : 2 pcs.

It is hereby certified that the materials being furnished in the quantity specified on the shipping memo have been produced in accordance with our normal processes and controls, and in conformance with the requirements of the referenced purchase order, specifications and drawings.

by S. Kurosawa
Manager, Quality Assurance

II

INSPECTION SHEET

Customer : CELWAVE NJ/IND
Article : SB350 BLOCK B
Material : SB350

Lot No. : 1
Quantity : 2
Date : Nov. 27. 2000

Item	A	B	C	D	E	F	G	H	I	J εr	K VISUAL
Spec.	0.736	0.770	0.760	0.110	0.238	0.110	0.119	0.140	0.424	35.256	
(+)	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.200	
(-)	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.200	
1	0.737	0.771	0.760	0.108	0.238	0.110	0.120	0.141	0.424	35.190	
2	0.737	0.770	0.760	0.108	0.239	0.110	0.120	0.141	0.425		
3	0.737	0.770	0.760	0.108	0.238	0.110	0.119				
4	0.737	0.770	0.760	0.108	0.239	0.110	0.119				
5	0.736	0.770	0.760	0.107	0.239	0.109	0.119				
6											
7											
8											
9											
10											
MAX.	0.737	0.771	0.760	0.108	0.239	0.110	0.120	0.141	0.425	35.190	
MIN.	0.736	0.770	0.760	0.107	0.238	0.109	0.119	0.141	0.424	35.190	
R	0.000	0.000	0.000	0.001	0.002	0.001	0.002	0.000	0.001	0.000	
n	5	5	5	5	5	5	5	2	2	1	5
Ave.	0.737	0.771	0.760	0.108	0.239	0.110	0.119	0.141	0.425	35.190	
Result	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC

(Remarks)

larger

(Judgment)

Acceptance
KYOCERA
QA
DIVISION

Witnessed by: K. Udea

Inspected by: T. Kobayashi

KY-391

KYOCERA CORPORATION